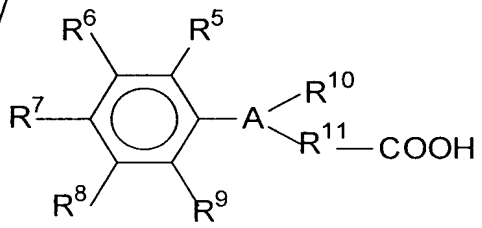
WHAT IS CLAIMED IS:

1. An IR-sensitive composition comprising:

a polymeric binder; and

a free radical polymerizable system consisting of: at least one component selected from unsaturated free radical polymerizable monomers, oligomers which are free radical polymerizable and polymers containing C=C bonds in the backbone and/or in the side chain groups; and an initiator system comprising: (a) at least one compound capable of absorbing IR radiation; (b) at least one compound capable of producing radicals; and (c) at least one carboxylic acid represented by the formula:



wherein each of R^5, R^6, R^7, R^8 and R^9 is independently selected from the group consisting of: hydrogen, alkyl, aryl, halogen, alkoxy, hydroxyalkyl, carboxyalkyl, alkylthio, alkylsulfonyl, sulfonic, alkylsulfonate, dialkylamino, acyl, alkoxycarbonyl, cyano and nitro; wherein R^5 and R^6, R^6 and R^7, R^7 and R^8, or R^8 and R^9 together optionally form an aromatic or aliphatic ring;

wherein R^{10} is selected from the group consisting of: hydrogen, alkyl, aryl, hydroxyalkyl, carboxyalkyl, acyl, alkoxycarbonyl, alkylsulfonyl and alkylsulfonate; or R^{10} and its bond together optionally form an electron pair; or R^9 and R^{11} together optionally form a ring;

wherein R^{11} is an alkylene group of C_1-C_6 carbon atoms; and wherein R^{10} and R^{11} together optionally form an aliphatic ring;

wherein A is a heteroatom selected from the group consisting of: N, O and S;

with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less.

2. The composition of claim 1, wherein said carboxyalkyl groups are represented by the formula:

$$-C_yH_{2y}-COOH$$

wherein y is an integer from 1 to 6.

3. The composition of claim 1, wherein said compound capable of absorbing IR radiation is selected from the group consisting of: a dye, a pigment and a combination thereof.

4. The composition of claim 1, wherein said compound capable of producing radicals is selected from the group consisting of: an azinium compound, a polyhaloalkyl-substituted compound and a combination thereof.

5. The composition of claim 1, wherein the total acid number of said polymeric binder is 50 mg KOH/g or less.

6. The composition of claim 5, wherein the total acid number of said polymeric binder is 30 mg KOH/g or less.

7. The composition of claim 6, wherein the total acid number of said polymeric binder is 10 mg KOH/g or less.

8. The composition of claim 7, wherein the total acid number of said polymeric binder is 0 mg KOH/g.

9. The composition of claim 1, wherein said polymeric binder is from about 20 wt% to about 80 wt% of the total weight of the composition.

10. The composition of claim 1, wherein said free radical polymerizable system is from about 35 wt% to about 65 wt% of the total weight of the composition.

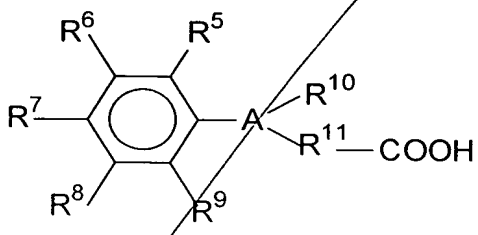
11. The composition of claim 1, wherein said initiator system is from about 3.5 wt% to about 45 wt% of the total weight of the composition.

12. The composition of claim 1, wherein said binder is selected from the group consisting of: a polymer derived from an acrylic ester, cellulose polymer, and a combination thereof.

13. A printing plate precursor, comprising:

a substrate; and

coated on said substrate an IR-sensitive composition comprising: a polymeric binder; and a free radical polymerizable system consisting of: at least one component selected from unsaturated free radical polymerizable monomers, oligomers which are free radical polymerizable and polymers containing C=C bonds in the backbone and/or in the side chain groups; and an initiator system comprising: (a) at least one compound capable of absorbing IR radiation; (b) at least one compound capable of producing radicals; and (c) at least one carboxylic acid represented by the formula:



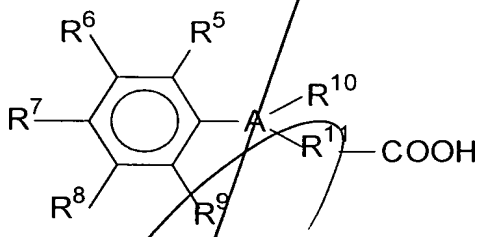
wherein each of R^5, R^6, R^7, R^8 and R^9 is independently selected from the group consisting of: hydrogen, alkyl, aryl, halogen, alkoxy, hydroxyalkyl, carboxyalkyl, alkylthio, alkylsulfonyl, sulfonic, alkylsulfonate, dialkylamino, acyl, alkoxycarbonyl, cyano and nitro; wherein R^5 and R^6, R^6 and R^7, R^7 and R^8, or R^8 and R^9 together optionally form an aromatic or aliphatic ring; wherein R^{10} is selected from the group consisting of: hydrogen, alkyl, aryl, hydroxyalkyl, carboxyalkyl, acyl, alkoxycarbonyl, alkylsulfonyl and alkylsulfonate; or R^{10} and its bond together optionally form an electron pair; or R^9 and R^{11} together optionally form a ring; wherein R^{11} is an alkylene group of C_1-C_6 carbon atoms; and wherein R^{10} and R^{11} together optionally form an aliphatic ring; wherein A is a heteroatom selected from the group consisting of: N, O and S; with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less.

14. The printing plate precursor of claim 13, further comprising: an oxygen-impermeable overcoat.

15. A process for preparing a printing plate, comprising:

imagewise exposing a printing plate precursor to IR radiation, said printing plate precursor comprising: a substrate; and coated on said substrate an IR-sensitive composition comprising: a polymeric binder; and a free radical polymerizable system consisting of: at least one component selected from unsaturated free radical polymerizable monomers,

oligomers which are free radical polymerizable and polymers containing C=C bonds in the backbone and/or in the side chain groups; and an initiator system comprising: (a) at least one compound capable of absorbing IR radiation; (b) at least one compound capable of producing radicals; and (c) at least one carboxylic acid represented by the formula:



wherein each of R^5, R^6, R^7, R^8 and R^9 is independently selected from the group consisting of: hydrogen, alkyl, aryl, halogen, alkoxy, hydroxyalkyl, carboxyalkyl, alkylthio, alkylsulfonyl, sulfonic, alkylsulfonate, dialkylamino, acyl, alkoxycarbonyl, cyano and nitro; wherein R^5 and R^6, R^6 and R^7, R^7 and R^8, or R^8 and R^9 together optionally form an aromatic or aliphatic ring; wherein R^{10} is selected from the group consisting of: hydrogen, alkyl, aryl, hydroxyalkyl, carboxyalkyl, acyl, alkoxycarbonyl, alkylsulfonyl and alkylsulfonate; or R^{10} and its bond together optionally form an electron pair; or R^9 and R^{11} together optionally form a ring; wherein R^{11} is an alkylene group of C_1-C_6 carbon atoms; and wherein R^{10} and R^{11} together optionally form an aliphatic ring; wherein A is a heteroatom selected from the group consisting of: N, O and S; with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less; and thereafter

developing with a developer solution to produce the printing plate.

16. The process of claim 15, further comprising:

heating said exposed precursor before said developing step.

17. The process of claim 15, further comprising:

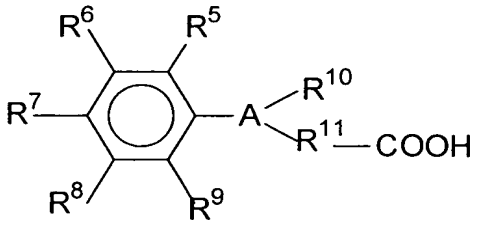
post development baking or UV-curing.

18. The process of claim 15, wherein said printing plate precursor further comprises: an oxygen-impermeable overcoat.

19. A printing plate prepared by the process of claim 14.

20. A method for producing an image, comprising:

coating an optionally pretreated substrate with an IR-sensitive composition comprising: a polymeric binder; and a free radical polymerizable system consisting of: at least one component selected from unsaturated free radical polymerizable monomers, oligomers which are free radical polymerizable and polymers containing C=C bonds in the backbone and/or in the side chain groups; and an initiator system comprising: (a) at least one compound capable of absorbing IR radiation; (b) at least one compound capable of producing radicals; and (c) at least one carboxylic acid represented by the formula:



wherein each of R^5, R^6, R^7, R^8 and R^9 is independently selected from the group consisting of: hydrogen, alkyl, aryl, halogen, alkoxy,

hydroxyalkyl, carboxyalkyl, alkylthio, alkylsulfonyl, sulfonic, alkylsulfonate, dialkylamino, acyl, alkoxycarbonyl, cyano and nitro; wherein R^5 and R^6, R^6 and R^7, R^7 and R^8, or R^8 and R^9 together optionally form an aromatic or aliphatic ring; wherein R^{10} is selected from the group consisting of: hydrogen, alkyl, aryl, hydroxyalkyl, carboxyalkyl, acyl, alkoxycarbonyl, alkylsulfonyl and alkylsulfonate; or R^{10} and its bond together optionally form an electron pair; or R^9 and R^{11} together optionally form a ring; wherein R^{11} is an alkylene group of C_1-C_6 carbon atoms; and wherein R^{10} and R^{11} together optionally form an aliphatic ring; wherein A is a heteroatom selected from the group consisting of: N, O and S; with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less to produce a printing plate precursor;

imagewise exposing said printing plate precursor to IR radiation to produce an imagewise exposed printing plate precursor; and thereafter

developing the precursor with an aqueous developer to obtain a printing plate having thereon a printable lithographic image.

21. A printing plate having thereon a printable lithographic image prepared according to the method of claim 20.

22. An IR-sensitive composition comprising:

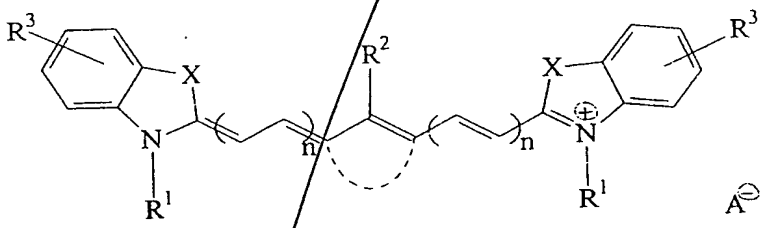
a polymeric binder; and

a free radical polymerizable system consisting of: at least one component selected from unsaturated free radical polymerizable monomers, oligomers which are free radical polymerizable and polymers containing C=C bonds in the backbone and/or in the side chain groups; and an initiator system comprising: (a) at least one compound capable of absorbing IR radiation; (b) at least one compound capable of producing radicals; and (c) at least one polycarboxylic acid having an aromatic moiety substituted with a heteroatom selected from N, O and S and further having at least two carboxyl groups wherein at least one of said

carboxyl groups is bonded to said heteroatom via a methylene group; with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less.

23. The composition of claim 22, wherein said compound capable of absorbing IR radiation is selected from the group consisting of: triarylamine dyes, thiazolium dyes, indolium dyes, oxazolium dyes, cyanine dyes, polyaniline dyes, polypyrrole dyes, polythiophene dyes, leuco dyes, phthalocyanine pigments and dyes and a combination thereof.

24. The composition of claim 23, wherein said compound capable of absorbing IR-radiation is a cyanine dye represented by formula (A):



(A)

wherein each X is independently selected from the group consisting of: S, O, NR and $C(alkyl)_2$;

each R^1 is independently selected from the group consisting of: an alkyl, an alkylsulfonate and an alkylammonium group;

R^2 is selected from the group consisting of: hydrogen, halogen, SR, SO_2R, OR and NR_2;

each R^3 is independently selected from the group consisting of: a hydrogen, an alkyl group, COOR, OR, SR, SO_3^-, NR_2, a halogen, and an optionally substituted benzofused ring;

A^- represents an anion;

- - - represents an optional five- or six-membered carbocyclic ring;

wherein each R is independently selected from the group consisting of: hydrogen, an alkyl and an aryl group; and

wherein each n is an integer independently selected from the group consisting of: 0, 1, 2 and 3.

25. The composition of claim 24, wherein said compound capable of absorbing IR radiation is selected from the group consisting of:

2-[2-[2-phenylsulfonyl-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indoliumchloride;

2-[2-[2-thiophenyl-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indoliumchloride;

2-[2-[2-thiophenyl-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclopenten-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indoliumtosylate;

2-[2-[2-chloro-3-[2-ethyl-(3H-benzthiazole-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-3-ethyl-benzthiazolium-tosylate;

2-[2-[2-chloro-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indolium tosylate; and a combination thereof.

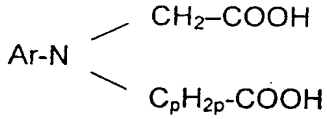
26. The composition of claim 22, wherein said compound capable of producing radicals is selected from the group consisting of: polyhaloalkyl-substituted compounds, azinium compounds and a combination thereof.

27. The composition of claim 26, wherein said compound capable of producing radicals is selected from the group consisting of:

N-methoxy-4-phenyl-pyridinium tetrafluoroborate
tribromomethylphenylsulfone;
1,2,3,4-tetrabromo-n-butane;
2-(4-methoxyphenyl)-4,6-bis(trichloromethyl)-s-triazine;
2-(4-chlorophenyl)-4,6-bis(trichloromethyl)-s-triazine;
2-phenyl-4,6-bis(trichloromethyl)-s-triazine;
2,4,6-tri-(trichloromethyl)-s-triazine;
2,4,6-tri-(tribromomethyl)-s-triazine;
2-hydroxytetradecyloxyphenyl phenyliodonium hexafluoroantimonate;
2-methoxy-4-phenylaminobenzenediazonium hexafluorophosphate and a combination thereof.

28. The composition of claim 22, wherein said polycarboxylic acid is selected from the group consisting of:

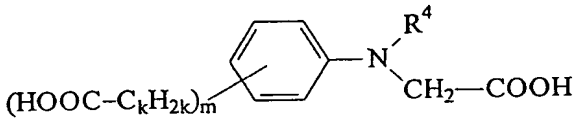
a compound represented by the formula (B):



(B)

wherein Ar is selected from the group consisting of: an unsubstituted aryl, a mono-substituted aryl and poly-substituted aryl group; and p is an integer from 1 to 5;

a compound represented by the formula (C):



(C)

wherein R^4 is selected from the group consisting of: hydrogen and a C_1-C_6 alkyl group; and wherein each of k and m is independently an integer from 1 to 5; and

a combination of compounds represented by formula (B) and (C).

29. The composition of claim 26, wherein said polycarboxylic acid is N-phenyliminodiacetic acid.

30. The composition of claim 22, further comprising one or more dyes for increasing the contrast of the image.

31. The composition of claim 22, wherein the total acid number of said polymeric binder is 50 mg KOH/g or less.

32. The composition of claim 31, wherein the total acid number of said polymeric binder is 30 mg KOH/g or less.

33. The composition of claim 32, wherein the total acid number of said polymeric binder is 10 mg KOH/g or less.

34. The composition of claim 33, wherein the total acid number of said polymeric binder is 0 mg KOH/g.

35. The composition of claim 22, wherein said polymeric binder is from about 20 wt% to about 80 wt% of the total weight of the composition.

36. The composition of claim 22, wherein said free radical polymerizable system is from about 35 wt% to about 65 wt% of the total weight of the composition.

37. The composition of claim 22, wherein said initiator system is from about 3.5 wt% to about 45 wt% of the total weight of the composition.

38. A printing plate precursor, comprising:

a substrate; and

coated on said substrate an IR-sensitive composition comprising: a polymeric binder; and a free radical polymerizable system consisting of: at least one component selected from unsaturated free radical polymerizable monomers, oligomers which are free radical polymerizable and polymers containing C=C bonds in the backbone and/or in the side chain groups; and an initiator system comprising: (a) at least one compound capable of absorbing IR radiation; (b) at least one compound capable of producing radicals; and (c) at least one polycarboxylic acid having an aromatic moiety substituted with a heteroatom selected from N, O and S and further having at least two carboxyl groups wherein at least one of said carboxyl groups is bonded to said heteroatom via a methylene group; with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less.

39. The printing plate precursor of claim 38, further comprising: an oxygen-impermeable overcoat.

40. A process for preparing a printing plate, comprising:

imagewise exposing a printing plate precursor to IR radiation, said printing plate precursor comprising: a substrate; and coated on said substrate an IR-sensitive composition comprising: a polymeric binder; and a free radical polymerizable system consisting of: at least one component selected from unsaturated free radical polymerizable monomers, oligomers which are free radical polymerizable and polymers containing C=C bonds in the backbone and/or in the side chain groups; and an initiator system comprising: (a) at least one compound capable of absorbing IR radiation; (b) at least one compound capable of producing radicals; and (c) at least one polycarboxylic acid having an aromatic moiety substituted with a heteroatom selected from N, O and S and further having at least two carboxyl groups wherein at least one of said carboxyl groups is bonded to said heteroatom via a methylene group; with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less; and thereafter

developing with a developer solution to produce the printing plate.

41. The process of claim 40, further comprising:

heating said exposed precursor before said developing step.

42. The process of claim 40, further comprising:

post development baking or UV-curing.

43. The process of claim 40, wherein said printing plate precursor further comprises:

an oxygen-impermeable overcoat.

44. A printing plate prepared by the process of claim 40.

45. A method for producing an image, comprising:

coating an optionally pretreated substrate with an IR-sensitive composition comprising: a polymeric binder; and a free radical polymerizable system consisting of: at least one component selected from unsaturated free radical polymerizable monomers, oligomers which are free radical polymerizable and polymers containing C=C bonds in the backbone and/or in the side chain groups; and an initiator system comprising: (a) at least one compound capable of absorbing IR radiation; (b) at least one compound capable of producing radicals; and (c) at least one polycarboxylic acid having an aromatic moiety substituted with a heteroatom selected from N, O and S and further having at least two carboxyl groups wherein at least one of said carboxyl groups is bonded to said heteroatom via a methylene group; with the proviso that the total acid number of said polymeric binder is 70 mg KOH/g or less to produce a printing plate precursor;

imagewise exposing said printing plate precursor to IR radiation to produce an imagewise exposed printing plate precursor; and thereafter

developing the precursor with an aqueous developer to obtain a printing plate having thereon a printable lithographic image.